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Job No: CTCE/BBMP/W.No.01/KRIDL/WMM/Gradation/2014-15

19.07.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.

Agency : Technical Manager, KRIDL, Bangalore.

Name of Work : Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014

Date of Testing : 19.07.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 24130

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	925	925	3.8	96.2	95-100
22.4	5250	6175	25.6	74.4	60-80
11.2	6250	12425	51.5	48.5	40-60
4.75	3415	15840	65.6	34.4	25-40
2.36	2485	18325	75.9	24.1	15-30
0.600	2005	20330	84.3	15.7	8-22
0.075	2500	22830	94.6	5.4	0-8

Note:

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Job No.: CTCE/BBMP/W.No.01/KRIDL/WMM/AIV/2014-15

19.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	19.07.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines	22.11	22.31	
	$100^* (W_2/W_1)\%$			22.03

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.01/KRIDL/WMM/S-7/2014-15 19.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Technical Reference	IS 2386(Part I) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	19.07.2014

Result : Flakiness Index = **12.58%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation Index 26.48%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No : CTCE/BBMP/W.No.01/KRIDL/BM(QB)/2014-15 26.07.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
AGENCY	:	Technical Manager, KRIDL, Bangalore.
NAME OF THE WORK	:	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	26.07.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	64	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	298	Min. 220

Note:

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Job No: CTCE/BBMP/W.No 01/KRIDL/BM/AIV/2014-15 26.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Source / Location	Hounex Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	26.07.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	375	376	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	82	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	293	291	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	21.87	22.61	22.24

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.01/KRIDL/BM/Slope/T/2014-15 : 26.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Work	: Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Technical Reference	: IS 2386(Part I) 1963 (RA 2011)
Type of Mix	: Bituminous Macadum
Date of Testing	: 26.07.2014

Flakiness Index = 12.96%

Elongation Index = 13.55%

Result : Combined Flakiness & Elongation index 26.51%

Comments:
→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.01/KRIDL/BM/Stripping/2014-15

28.07.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Type of Mix	Bituminous Macadam
Date of Testing	28.07.2014

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

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Comments:
→ Minimum allowable Aggregate retained coating for Bituminous Macadam is 95%

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Job No: CTCE/BBMP/W.No.01/KRIDL/BM/Sp_Wt/2014-15

28.07.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	28.07.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 2	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	2026	2025	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1274	1276	1275	
4	Weight of saturated surface dry aggregate in air	W_3 g	2030	2025	2010	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_4)$ g	756	749	735	
6	Weight of oven dried aggregate	W_4 g	1999	2015	2010	
7	Specific Gravity	$W_4/(W_3-W_5)$	2.644	2.690	2.735	2.689
8	Apparent Specific gravity	$W_4/(W_4-W_5)$	2.757	2.727	2.735	2.746
9	Water Absorption	$((W_3-W_4)*100)/W_4$	1.55%	0.80%	0.00%	0.78%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Job No: CTCE/BBMP/W.No.01/KRIDL/BM/Agg G/2014-15 28.07.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	28.07.2014

Total Weight of Sample: 5200 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	362	6.96	6.96	93.04	90-100	
13.2	1685	32.40	39.37	60.63	56-88	
4.75	1488	28.62	67.98	32.02	16-36	
2.36	969	18.63	86.62	13.38	4-19	
0.3	386	7.42	94.04	5.96	2-10	
0.075	142	2.73	96.77	3.23	0-8	

Total Weight of Sample: 5300 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade II MORTH specification
19	296	5.58	5.58	94.42	90-100	
13.2	1783	33.64	39.23	60.77	56-88	
4.75	1525	28.77	68.00	32.00	16-36	
2.36	895	16.89	84.89	15.11	4-19	
0.3	412	7.77	92.66	7.34	2-10	
0.075	153	2.89	95.55	4.45	0-8	

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TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
AGENCY	:	Technical Manager, KRIDL, Bangalore.
NAME OF THE WORK	:	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	28.07.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	64	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	44	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	292	Min. 220

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Job No: CTCE/BBMP/W.No.01/KRIDL/SDBC/AIV/2014-15 28.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
28.07.2014	28.07.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	379	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines $100 * (W_2/W_1)\%$	20.63	20.84	20.7

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 24%

Note:

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Job No: CTCE/BBMP/W.No 01/KRIDL/SDBC/Stripping/2014-15 29.07.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the work	Providing asphalting on Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	29.07.2014

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

Note:

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Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	29.07.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2023	2024	2025	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1268	1269	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2014	2015	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_4)$ g	746	746	750	
6	Weight of oven dried aggregate	W_4 g	2000	1999	2001	
7	Specific Gravity	$W_4/(W_3-W_5)$	2.681	2.680	2.668	2.676
8	Apparent Specific gravity	$W_4/(W_4-W_5)$	2.732	2.738	2.737	2.736
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.80%	0.95%	0.82%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0

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Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Providing asphalting to Old post office road in Ward No.01 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/YSD/PR/185/2014-15 Dated: 16.07.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	29.07.2014

Total Weight of Sample: 5100 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	360	7.1	7.06	92.94	90-100	
4.75	2540	49.8	56.86	43.14	35-51	
2.36	725	14.2	71.08	28.92	24-39	
1.18	490	9.6	80.69	19.31	15-30	
0.3	440	8.6	89.31	10.69	9-19	
0.075	330	6.5	95.78	4.22	3-8	

Total Weight of Sample: 5200 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	430	8.3	8.27	91.73	90-100	
4.75	2615	50.3	58.56	41.44	35-51	
2.36	810	15.6	74.13	25.87	24-39	
1.18	510	9.8	83.94	16.06	15-30	
0.3	225	4.3	88.27	11.73	9-19	
0.075	250	4.8	93.08	6.92	3-8	

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory.
- The results indicated above are based on the tests carried out on the samples received in the laboratory.
- Any Query regarding the report must be reported within 30 days from the date of testing.

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